

# Effects of low pressure radio frequency discharge on the physical and mechanical characteristics and chemical composition of diffusion coating on a surface of complex configuration details

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## Abstract

© Published under licence by IOP Publishing Ltd. The work deals with the influence of low-pressure radio frequency (RF) discharge on the surface properties of metals and their alloys. As objects of research to study the interaction of the jet low pressure RF discharge into the surface of the material the following materials were chosen: tungsten cobalt alloy, high speed steel, structural steel. In the presence of the materials energy parameters of low pressure RF discharge flows in the discharge chamber and the electrode gap were studied. A quantitative assessment of the gas composition inside the chamber to determine the characteristics of the plasma flow, making the major contribution to the modification of the surface was carried out. The influence of the input parameters of the plasma unit on the discharge characteristics was held. Identification of the main processes responsible for the modification of the surface of metals and alloys with the metal sample in the plasma jet and the effect of samples of products complex configuration on its properties is determined. The results of studies of physical and mechanical characteristics and chemical composition of the surface layers of high-speed steels, alloys and steel before and after treatment by low pressure radio frequency discharges with the instrumental indentation methods and X-ray photo-electron spectroscopy. With the help of the quality control system of the inner surfaces tubular products were studied.

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